



**Title:** Approval to Purchase Real-time Sensor Network Equipment

**Resolution number:** 20-007

**Prepared by:** Name: Kailey Cermak  
Phone: 952-641-4501  
kcermak@minnehahacreek.org

**Reviewed by:** Name/Title: Brian Beck/R&M Manager & District Council

**Recommended action:** Authorize purchase of real-time sensor network equipment

**Budget considerations:** Fund name and code: Water Quality-Supplies/Equipment 500-5001-4570  
Fund budget: \$220,000  
Expenditures to date: \$0.00  
Requested amount of funding: not to exceed \$115,000

**Past Board action:** None

**Background:**

In an effort to continuously improve how the Minnehaha Creek Watershed District (District or MCWD) delivers on its core mission of managing water quantity and quality, Research and Monitoring (R&M) staff have been refining how and where we collect data to better support project identification, improve public communication, and inform high-water decision making. Ultimately, District staff determined the existing methods for measuring water level and flow were not providing enough information to District staff, concerned public, and partner agencies.

In parallel, Project Maintenance and Land Management (PMLM) staff have formed a multi-agency partnership which includes Hennepin County Emergency Management (HCEM), United States Geological Survey (USGS), and the National Weather Service (NWS) to improve water level management using Grays Bay Dam. PMLM and R&M staff coordinated with partners to understand what information would help partner agencies, municipalities, and the public with high water issues. The following information was gleaned from those discussions:

- City staff currently take time to document water levels along the creek
- HCEM was in early planning stages to deploy real-time water level sensors at many of the same locations
- Recent stakeholder surveys found more access to data on the District website was one of the top requests

During these discussions, it became clear that understanding real-time water levels at a higher resolution across the watershed would benefit the District while also assisting our partner agencies and creek communities. Therefore, District staff mapped out the real-time sensor network (RESNET) to accomplish goals for internal and external stakeholders, which include:

## 1. Emergency Planning and Communication

While the District does not play an active role in emergency management, this network solidifies our role as information broker. It is our goal to provide our cities and partner agencies with updated communication and information on watershed conditions to better prepare them for flooding events and inform their emergency planning efforts. Giving residents access to real-time water level is another goal of the network and will be a task incorporated into the development of the new District website.

## 2. Near term climate adaptation management

### a. Water Budget

The District already has access to real-time precipitation on a subwatershed scale thanks to HCEM's Mesonet stations. By layering in the sensor network, we can track how the water falling on the landscape is impacting water levels and flow in each area. Improving our understanding of the District's water budget at a finer scale will allow us to predict how each subwatershed will respond to impending storm events.

### b. Improved Dam Management

Staff currently utilize the forecasting tools provided by NWS to inform operations of Grays Bay Dam. However, staff's current access to real-time water level and flow conditions is limited to only two USGS stations along the creek, and no information is available for how much water is draining into Lake Minnetonka (Attachment 1). The proposed sensor network gives staff access to watershed conditions at eight of Lake Minnetonka's major tributaries and an additional 17 locations along Minnehaha Creek. Having a granular understanding of how much rain has fallen within the District, paired with our improved understanding of each subwatershed's water budget, staff can more proactively and effectively operate Grays Bay Dam.

## 3. Refined storm nutrient loads

Annual stream nutrient loads are currently calculated using the District's discrete flow measurements and water quality samples. This method is valid, however, these instantaneous data points are a snap shot in time and poorly characterize flow and concentrations seen in the creek during storm peaks. Adding continuous water level sensors and automated storm samplers at the proposed locations allow staff to more accurately characterize how the creek's water quality and quantity is being impacted by storms. This ability to characterize creek conditions during these events is critical for telling data driven stories around project effectiveness. For example, the future positive impacts that 325 Blake will have on water quality and quantity will be seen in the creek only during storm events; without RESNET equipment the story would fall flat.

## 4. Long Term Climate Adaptation Planning

The District's current hydrologic and hydraulics (H&H) model was built during a period where continuous flow data was relatively uncommon and software options were limited. Today, H&H models are capable of utilizing greater processing power. Furthermore, advances in storage and cellular technology have dramatically lowered the cost of having real-time continuous flow measurements. The data collected with RESNET will be used to develop the District's future H&H model. The model will be used to run scenarios for expected events or for future climate conditions. This is a pivotal step to inform how the District and its partners can plan for and remain resilient against the changing climate.

## RESNET Equipment and Costs

District staff began identifying what equipment was needed for each station to accomplish as many goals as possible while simultaneously minimizing costs. The result was a mosaic of equipment that was carefully vetted since each location is tasked with a unique set of goals. For example, monitoring locations in the upper watershed are designed to enhance existing forecasting for dam operations while stations along Minnehaha Creek will improve our ability to communicate water levels with communities and agency partners (Attachment 1). The equipment can be grouped into four general categories:

1. Level sensors: collect continuous water level elevation
2. Velocity sensors: measure velocity where level alone is not a predictor of flow
3. Automated storm samplers: triggered during storm events to collect water samples
4. Cellular communication devices: transmit logged data back to MCWD server

During the early phases of RESNET, Research and Monitoring budgeted \$175,000 to cover the cost of new equipment in 2020. In parallel with the 2020 budget development, the District partnered with HCEM to identify an opportunity to apply for a grant from the Federal Emergency Management Agency (FEMA) to cover a portion of the equipment costs. Presently, HCEM is expecting approximately \$42,000 in grant funding from FEMA's Hazard Mitigation Grant Program. Equipment purchased by HCEM's grant dollars will be maintained and operated by MCWD staff. The cost breakdown between MCWD and Hennepin County is below:

Equipment Type	MCWD	HCEM
Level sensors	\$25,732	\$18,771
Velocity sensors	\$34,860	\$0
Storm samplers	\$35,043	\$0
Communication devices	\$18,002	\$22,623
Total cost	<b>\$113,637</b>	<b>\$41,394</b>

R&M staff have tested equipment options and researched prices among available vendors and recommends purchasing a subset of equipment from three different vendors: In-situ Inc., OTT Hydromet, and Tech Sales, Co. While Tech Sales Co. offers pricing through Minnesota's cooperative purchasing venture contract, it does not offer equipment that meets District requirements for all items identified above. The overall purchase will encompass a number of discrete pieces of equipment, each of which may be obtained separately through a vendor. No single piece of equipment exceeds \$25,000 in price, and therefore, on advice of District counsel, it was not necessary to undertake a formal competitive quote process. Staff has used its knowledge of vendors, specialized equipment, and District needs to determine which vendor is the preferred source for the equipment. Staff are requesting authorization to purchase the RESNET equipment in an amount not to exceed \$115,000. Detailed equipment quotes are attached.

### Supporting documents (list attachments):

1. Map of RESNET stations
2. OTT Hydromet quote
3. In-situ, Inc. quote
4. Tech Sales Co. quote part 1
5. Tech Sales Co. quote part 2



**RESOLUTION**

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**Resolution number:** 20-007

**Title:** Approval to Purchase Real-time Sensor Network Equipment

WHEREAS, The Minnehaha Creek Watershed District (MCWD) has experienced high water the past six years which led staff to develop improved methods and systems to manage water levels across the watershed

WHEREAS, during high water periods, MCWD’s role has been to collect data and communicate information

WHEREAS, the real-time sensor network was developed to more effectively manage grays bay dam while also providing detailed information to our creek communities and partner agencies to inform emergency planning and management decisions

WHEREAS, specialized equipment is required to deliver on the goals of the real-time sensor network

WHEREAS, staff has researched and tested equipment from available vendors and recommends purchasing a subset of equipment from three different vendors

NOW, THEREFORE, BE IT RESOLVED that the Minnehaha Creek Watershed District Board of Managers: approves the purchase of the real-time sensor network equipment from In-situ Inc., OTT Hydromet, and Tech Sales Co. in a total amount not to exceed \$115,000

Resolution Number 20-007 was moved by Manager \_\_\_\_\_, seconded by Manager \_\_\_\_\_. Motion to adopt the resolution \_\_\_ ayes, \_\_\_ nays, \_\_\_ abstentions. Date: [Click here to enter a date.](#)

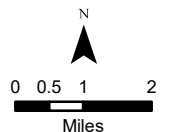
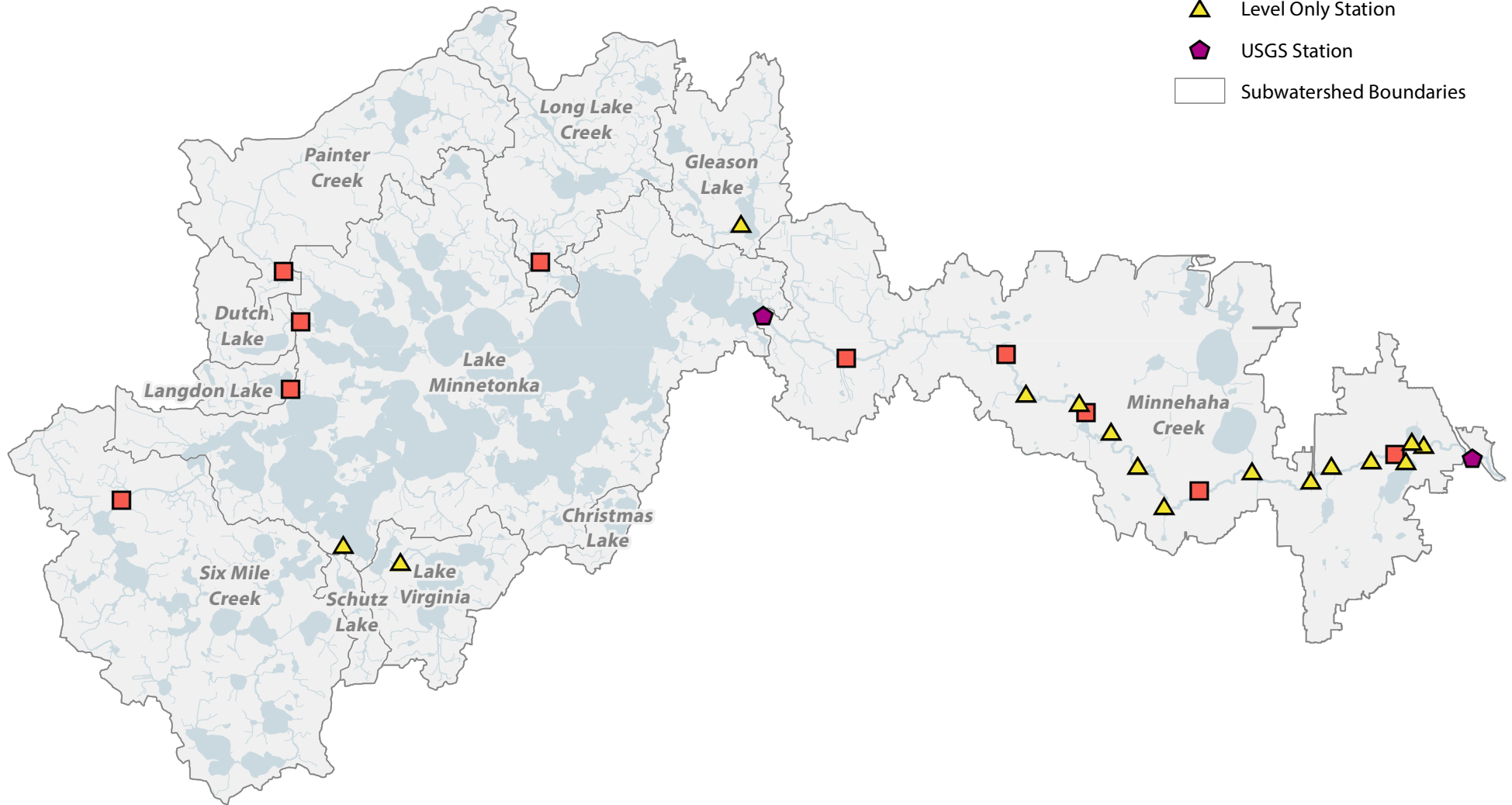
\_\_\_\_\_  
Secretary Date: \_\_\_\_\_

# Attachment 1

## MINNEHAHA CREEK WATERSHED DISTRICT REAL-TIME SENSOR NETWORK

### Legend

- Flow + Stormwater Station
- Level Only Station
- USGS Station
- Subwatershed Boundaries



**Date** 14 Jan 2020  
**Quotation Number** 19-012961  
**Valid For** 60 Days

**Bill To:**  
 Minnehaha Creek Watershed District  
 15320 Minnetonka Blvd  
 Minnetonka, Minnesota 55345  
 kcermak@minnehahacreek.org

**Ship To:**  
 Minnehaha Creek Watershed District  
 15320 Minnetonka Blvd  
 Minnetonka, Minnesota 55345

OTS PLS

No	Part #	Product Description	Qty	Unit Price (USD)	Ext. Price (USD)
1	63.038.001.9051	OTT PLS-C, SDI-12, 10M "OTT PLS-C SDI-12 sensor for measuring surface or ground water level/pressure, temperature and conductivity. Measuring Range 0-10m Please order a FAD 4 PF HUMIDITY ABSORBER (63.025.021.4.2) or a FAD 5 HUMIDITY ABSORBER CONNECTION BOX (63.037.025.3.2) as accessorie."	3.0	1,918.00	5,754.00
2	97.000.033.9.5	PLS PROBE CABLE, METERS Integrated vented cable for use with OTT PLS level sensor - per meter <b>Notes:</b> **NOTE: 6m cable for each of the (3) PLS-C units	18.0	5.74	103.32
3	63.037.025.3.2	FAD 5 HUMIDITY ABSORBER CONNECTION BOX FAD 5 Humidity absorber connection enclosure for use with OTT PLS level sensor	3.0	135.00	405.00
4	96.140.173.9.5	BRACKET, STRAIGHT CABLE SUSPENSION Straight hanging cable suspension bracket for use with OTT pressure sensors	15.0	16.82	252.30
<b>Group Subtotal Price</b>					6,514.62

XLINK500 LTE with Verizon Cellular Modem and Antenna

No	Part #	Product Description	Qty	Unit Price (USD)	Ext. Price (USD)
5	XLINK500-C1-1	XLINK 500, VERIZON LTE XLINK 500, VERIZON LTE <b>Notes:</b> includes pluggable card for Verizon--Minnehaha to provide their own Verizon SIM	4.0	1,699.00	6,796.00
6	1291-1033	CDMA Antenna - Indoor mount, adhesive back, 12 inch cable, SMA-M Connector	4.0	15.00	60.00
<b>Group Subtotal Price</b>					6,856.00

Solar

No	Part #	Product Description	Qty	Unit Price (USD)	Ext. Price (USD)
7	5100-0410-1	Solar Panel, 20 Watt unregulated, includes mount. Order cable 6411-1017-3 separately	3.0	438.00	1,314.00
8	6411-1017-3	Cable Assy, Solar Panel, 18 ft for 8200/8210 ***	3.0	55.00	165.00
<b>Group Subtotal Price</b>					1,479.00

Bubbler

No	Part #	Product Description	Qty	Unit Price (USD)	Ext. Price (USD)
9	56-0133-25-1S	Compact Constant Flow Bubbler with 3/8" fitting	3.0	3,560.00	10,680.00
10	6661-1314-1	Orifice Termination Tube	3.0	196.00	588.00
11	2911-1183	Tubing, Orifice Line, Polyurethane, Black, Per Ft.	100.0	2.05	205.00
<b>Group Subtotal Price</b>					11,473.00

Notes:

<b>Payment Terms</b>	Net 30 w/Approved Credit
<b>Freight Terms</b>	EXW - Ex Works Origin
<b>Expected Delivery Time</b>	
<b>Sales Tax</b>	Proof of tax exempt status or payment of sales tax is the responsibility of the buyer

USD

<b>Total Price :</b>	26,322.62
<b>Tax :</b>	TBD
<b>Freight :</b>	0
<b>Grand Total Price :</b>	26,322.62

If you have any questions or need further information, please don't hesitate to contact me. I look forward to hearing from you soon.

Sincerely,  
 Brent Register  
 Email: brent.register@otthydromet.com, Phone: 9703971094  
 Prepared by: Brent Register

**Terms and Conditions**

All purchases of Sutron products and/or services are expressly and without limitation subject to Sutron's corporate Terms and Conditions of Sale, incorporated herein by reference and published on Sutron's website at <http://www.sutron.com/terms-of-sale/>. These Terms and Conditions are contained directly and/or by reference in Sutron's offer, order acknowledgment, and invoice documents. The first of the following acts constitutes an acceptance of Sutron's offer and not a counteroffer and creates a contract of sale ("Contract") in accordance with these Terms and Conditions: (i) Buyer's issuance of a purchase order document against Sutron's offer; (ii) acknowledgement of Buyer's order by Sutron; or (iii) commencement of any performance by Sutron pursuant to Buyer's order. Provisions contained in Buyer's purchase documents (including electronic commerce interfaces) that materially alter, add to or subtract from the provisions of these Terms and Conditions of Sale are not a part of the Contract. No order shall be binding

# Attachment 3



In-Situ, Inc.  
221 E. Lincoln Avenue  
Fort Collins, CO 80524  
U.S.A.

Tel: (800) 446-7488  
Fax: (970) 498-1598  
Email: sales@in-situ.com  
Web: www.in-situ.com

## Quote – Q-48067

Issued By: Angela Lull  
Date: January 8, 2020  
Quote Valid for 30 days

<b>Sales Manager</b> Rick Struzynski	<b>Customer ID</b> 004017	<b>Payment Terms</b> NET 30 DAYS	<b>Shipping Method</b>	<b>INCO Terms</b>	<b>Final Destination</b> United States Minnesota
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<b>Quote To:</b> Minnehaha Creek Watershed Dist 15320 MINNETONKA BLVD MINNETONKA, Minnesota 55345 United States
<b>Attn:</b> Kailey Cermak kcermak@minnehahacreek.org (952) 471-0590

<b>Ship To:</b> Minnehaha Creek Watershed Dist 15320 Minnetonka Blvd Minnetonka, Minnesota 55345 United States
<b>Comments:</b>

Equipment						
Line	Product Description	Part Number	Unit of Sale	Qty.	Unit Price	Total Price
1.	Level TROLL 400, Level Sensor Range - 11m, 35 ft (30 Psia)	0099240	Each	8	\$795.00	\$6,360.00
2.	Rugged Twist-Lock Cable, Non-Vented, TPU, No Reel, Twist-Lock, None	0052000-05-01-08-00	8 ft	8	\$173.00	\$1,384.00
3.	VuLink Telemetry Pre-Order. VuLink will be available for shipping starting Q2 2020 ( <a href="https://in-situ.com/vulink/">https://in-situ.com/vulink/</a> ).	ISR-0000000-VL	Each	8	\$795.00	\$6,360.00
<b>Subtotal:</b>						<b>\$14,104.00</b>

Quote Total	
<p><i>Tax is not normally quoted due to State &amp; local variability. If you need to have Tax included in this quotation, please contact us.</i></p> <p><i>If your organization is a tax-exempt entity, please email or fax a copy of your tax-exempt certificate to taxcerts@in-situ.com or fax to (970) 498-1598.</i></p> <p><i>Tax rates will be based on delivery address of the order.</i></p>	
<b>Sales Tax:</b>	<b>\$0.00</b>
<p>For further information regarding the Warranty or Terms and Conditions, please refer to our website at <a href="http://in-situ.com/terms-conditions/">http://in-situ.com/terms-conditions/</a></p> <p>All quoted product &amp; service prices are in U.S. Dollars unless specifically noted otherwise.</p>	
<b>Shipping:</b>	
<b>Total Amount (Excludes Optional Items):</b>	<b>USD \$17,411.50</b>



# Attachment 3



In-Situ, Inc.  
221 E. Lincoln Avenue  
Fort Collins, CO 80524  
U.S.A.

Tel: (800) 446-7488  
Fax: (970) 498-1598  
Email: sales@in-situ.com  
Web: www.in-situ.com

**Quote – Q-48067**

Issued By: Angela Lull  
Date: January 8, 2020  
Quote Valid for 30 days

<b>VuLink Data</b>						
<b>Start Date: 05-24-2020</b>			<b>Term: 12 Months</b>			
Line	Product Description	Part Number	Unit of Sale	Qty.	Unit Price	Customer Total Price
4.	VuLink Complete Data Services Plan, includes Cloud access and viewing, 1MB/month cellular data, SIM card	0050100	12 Month	8	\$35.00	\$3,307.50
5.	Standard Data User Package (1MB/Month)		12 Month	8	\$0.00	\$0.00
					<b>Subtotal:</b>	<b>\$3,307.50</b>
<b>Terms &amp; Conditions</b>						
<p><b>TERMS &amp; CONDITIONS</b> The terms of this contract, reflected above, are effective until terminated by either party. This contract will auto-renew at each renewal term, unless a) the customer notifies In-Situ Inc. at least 15 days before the end of the initial term or the renewal term, or b) the customer declines auto-renewal and it is reflected on the contract. In the event this contract is terminated early, an amount equal to 50% of the remaining contract amount will be charged.</p> <p><b>OVERAGES</b> In the event you go over your allotted amount of data, an overage fee will be applied. The overage fee will be \$10.00 per megabyte over your allotted data amount.</p> <p><b>SUSPENSION</b> In-Situ will not suspend services for customers. In order to stop service a customer will need to request their service be terminated.</p> <p><b>AMENDMENTS</b> In the event this contract is amended for any reason a new contract will need to be signed. By signing this contract the undersigned is agreeing to the terms set forth above, as well as the Hydrovu Terms of Use and the In-Situ, Inc. Terms &amp; Conditions (located at <a href="http://www.in-situ.com/legal/terms-conditions/">www.in-situ.com/legal/terms-conditions/</a>). The undersigned represents that he/she has the authority to execute this contract/agreement on behalf of the business identified.</p>			<p><b>PAYMENT TERMS</b> In-Situ is pleased to extend terms of net 30 days to customers who have established a credit account with us. If you wish to open a new account, credit applications are available upon request. A bank reference and four trade references are required. Payments are due in 30 days from the date of the invoice. All past due invoices and uncollected funds shall be charged interest at a rate of 1.5% per month. The customer agrees to pay all collection costs, including attorneys' fees, and penalty charges if collection services on the account become necessary. Letter of credit and wire transfer fees will be added to the invoice at a rate of \$350 and \$30 respectively.</p> <p><b>DISCLAIMER</b> <i>DUE TO CONTINUING PRODUCT DEVELOPMENT, IN-SITU RESERVES THE RIGHT TO ALTER SPECIFICATIONS WITHOUT PRIOR NOTICE. IN-SITU ALSO RESERVES THE RIGHT TO ALTER TERMS PRIOR TO ACCEPTANCE OF THE ORDER.</i></p>			

Attachment 4

QUOTATION

**Quotation From:**

TECH SALES CO.  
 311 W. 44TH STREET  
 MINNEAPOLIS MN 55409  
**Ph:** (612) 823-8238 **Fx:** (612) 823-4272

**Page:** 1

**Quotation For:**

Minnehaha Creek Watershed  
 15320 Minnetonka Blvd  
 Minnetonka MN 55345  
**Ph:** (952) 471-0590 **Fx:** (952) 471-0682

**Quotation#:** 2200035  
**Revision#:**  
**Date:** 01/09/20

**Attn:** Kailey Cermak **E-Mail:** kcermak@minnehahacreek.org  
**Ref:** Isco 6712 Samplers

**Please Address Order To:**

TECH SALES CO.  
 311 W. 44TH STREET  
 MINNEAPOLIS MN 55409

**FOB:** Destination  
**Shipment:** 3-4 Weeks ARO  
**Salesman:** Travis DeGroot  
**Validity:** 30 Days  
**Terms:** NET 30 DAYS

\*\*\*Pricing per MN State Contract# 78637 & Free Shipping\*\*\*

Item	Qty	Part#/Description	Unit Price	Total Price
1	8	686710070 Isco Model 6712 Full-size Portable Sampler. Includes controller, top cover, center section, base, distributor arm, two pump tubes, instruction manual, & pocket guide. Does not include bottle configuration kit.	3,794.30	30,354.40
2	4	686700006 24-bottle Configuration for 6700 Series Full-size Portable Sampler. Includes 24 polypropylene 1-liter bottles with caps, bottle retaining ring, and two discharge tubes.	220.40	881.60
3	4	686700012 4-bottle Configuration for 6700 Series Full-size Portable Sampler. Includes four polypropylene 1-gal round bottles with caps, bottle locating rack, and two discharge tubes.	342.00	1,368.00
4	6	601394023 Connect cable for external 12V DC source. 6 ft. cable for powering portable Iscosampler or flow meters from an external 12V DC source, such as an automotive or deep-cycle marine battery. Terminates in heavy-duty battery clips. For use with Isco GLS, 3700, 6100, 6700 Series Portable Samplers & 4200 Series Flowmeters	96.90	581.40
5	4	601684088 Model 913 Power Converter & Battery Charger, 120VAC	265.05	1,060.20
6	8	609004367 3/8" standard weighted polypropylene strainer	78.85	630.80
7	8	603709002 Tubing coupler, 3/8 inch. One-piece, clampless coupler made of stainless steel. Can be used with any Isco sampler.	20.90	167.20

\*\*\*\*\* CONTINUED ON PAGE 2 \*\*\*\*\*

# Q U O T A T I O N

Page: 2

Quotation#: 2200035  
Revision#:   
Date: 01/09/20

Item	Qty	Part#/Description	Unit Price	Total Price
			<b>Quote Total:</b>	<b>35,043.60</b>

Prices shown do include freight but NOT sales tax. MasterCard/Visa payments are accepted but may be subject to a 4% surcharge. Please review this quotation and let us know if you have any questions.

By: \_\_\_\_\_  
Travis DeGroot

**Q U O T A T I O N****Quotation From:**

TECH SALES CO.  
311 W. 44TH STREET  
MINNEAPOLIS MN 55409  
Ph: (612) 823-8238 Fx: (612) 823-4272

Page: 1

**Quotation For:**

Minnehaha Creek Watershed  
15320 Minnetonka Blvd  
Minnetonka MN 55345  
Ph: (952) 641-4501 Fx: (952) 471-0682

Quotation#: 2200010  
Revision#: 1  
Date: 01/15/20

Attn: Kailey Cermak E-Mail: kcermak@minnehahacreek.org  
Ref: SonTek SL 1500

**Please Address Order To:**

TECH SALES CO.  
311 W. 44TH STREET  
MINNEAPOLIS MN 55409

FOB: Factory  
Shipment: 3-4 Weeks ARO  
Salesman: Travis DeGroot  
Validity: 30 Days  
Terms: NET 30 DAYS

Item	Qty	Part#/Description	Unit Price	Total Price
1	3	sl1500-3G SonTek-SL 1500-kHz 2-D side-looking real time acoustic Doppler current meter/flowmeter. Features advanced data processing including the SmartPulseHD feature, integrated velocity measurement cell plus current profiling, vertical acoustic beam and pressure sensor (20m range, 0.25% accuracy) for water level, internal flow calculations for both instantaneous discharge as well as total volume, temperature sensor, tilt sensor, RS232, SDI-12, Modbus interfaces and 4 GB recorder in a low profile urethane pressure case.	9,500.00	28,500.00
2	3	36-0040-010 10-m power and RS232/SDI-12/Modbus communications cable, compatible with the SonTek-IQ Flow Display, 5-pin male dry-pluggable to terminal block	270.00	810.00
3	3	24-0050 SL Mounting Frame Assembly. Consists of 4 ft length mounting frame section, slide assembly with adjustable angle mounting plate, plus handle bar.	1,420.00	4,260.00
4	3	24-0051 SL and Argonaut-SW mounting frame section, 4 ft length.	430.00	1,290.00
			<b>Quote Total:</b>	<b>34,860.00</b>

Prices shown do not include freight or sales tax. MasterCard/Visa payments are accepted but may be subject to a 4% surcharge. Please review this quotation and let us know if you have any questions.

By: \_\_\_\_\_  
Jesse DeGroot for Travis DeGroot